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67337 7590 04/26/2017 DYKEMA GOSSETT PLLC (STJ) 4000 Wells Fargo Center 90 South Seventh Street Minneapolis, MN 55402			EXAMINER KINNARD, LISA M	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ERIC S. OLSON, CARLOS CARBONERA,
LEV A. KOYRAKH, and DANIEL R. STARKS

Appeal 2015-004619
Application 13/231,284
Technology Center 3700

Before: CHARLES N. GREENHUT, NATHAN A. ENGELS, and
ERIC C. JESCHKE, *Administrative Patent Judges*.

GREENHUT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from a rejection of claims 1–
22. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

CLAIMED SUBJECT MATTER

The claims are directed to a catheter navigation method and system using impedance and magnetic field measurements. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method of operating a computer system comprising a first positioning system and a second positioning system, comprising the steps of:

determining an interpolation function configured to register a first, non-orthonormal coordinate system in a second, orthonormal coordinate system, wherein said first and second coordinate systems are independent, wherein said determining an interpolation function comprises:

collecting a plurality of fiducial pairs in three-dimensional (3D) space distributed throughout a region of interest, each fiducial pair including (1) a first coordinate in said first coordinate system measured by a first positioning system and (2) a second coordinate in said second coordinate system measured by a second positioning system, each fiducial pair corresponding to a physical point in 3D space in the region of interest; and

applying an interpolation algorithm to said plurality of fiducial pairs to yield said interpolation function;

obtaining a first coordinate in said first coordinate system within said region of interest; and

determining, by a computer processor associated with the computer system, a corresponding second coordinate in said second coordinate system in accordance with said interpolation function.

REFERENCES

The prior art relied upon by the Examiner is:

Galloway	US 7,072,707 B2	July 4, 2006
Dean	US 7,747,305 B2	June 29, 2010
Doddrell	US 7,088,099 B2	Aug. 8, 2006
Govari	US 2007/0016007 A1	Jan. 18, 2007
Khamene	US 2009/0067755 A1	Mar. 12, 2009
Klingenbeck-Regn	US 2009/0198126 A1	Aug. 6, 2009

REJECTIONS

Claims 1–5, 7–10, 14–16, 18, 19, 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Govari, Kraus and Khamene.

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Govari, Kraus, Khamene and Doddrell.

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Govari, Doddrell, and Klingenbeck-Regn.

Claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Govari, Doddrell, Khamene, and Klingenbeck-Regn.

Claim 17 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Govari, Kraus, Khamene, and Galloway.

Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Govari, Kraus, Khamene, and Dean.

OPINION

In rejecting independent claims 1 and 14 the Examiner finds that “Khamene discloses: i. a set of fiducial (landmark) pairs [paragraph [[0011]]; and, ii. applying an interpolation algorithm to said plurality of fiducial pairs to yield an interpolation function [paragraph [0004]].” Non-Final Act. 3. The Examiner does not expressly identify in the Office Action, and it is not apparent, exactly what elements of Khamene in the referenced paragraphs constitute the recited “fiducial pairs.”¹ Nor does the Examiner

¹ See 37 C.F.R. § 1.104(c)(2) (“When a reference is complex . . . , the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.”)

clarify this point in the Answer. Paragraph 4 of Khamene discusses an aspect of the main problem Khamene sought to address—displacement of points in medical imaging, resulting, for example, from breathing. Paras. 3–4.

Paragraph 11 is largely devoted to a mathematical equation involving points $P^I = \{P_1^I \dots, P_i^I \dots, P_n^I\}$ defining the edges of image I. Although it is not clear what the Examiner regards as the recited “plurality of fiducial pairs,” Appellants presume the Examiner is relying on pairs of points on the edge of the object in different images. App. Br. 7 (“the ‘fiducial pairs’ identified by the Office Action (which are points on the edge of the object as seen in the separate images—for example, the edges of the lung at full inhale and at full exhale)”). To distinguish claims 1 and 14 over the subject matter presumably relied upon by the Examiner, Appellants argue that the points of Khamene that Appellants understand to be relied upon by the Examiner “do not occupy the same point in physical space.”² Indeed, if the points occupied the same point in physical space (i.e., if there was no movement between images), there would be no need for the interpolation taught by Khamene.” App. Br. 7. We have carefully reviewed the Examiner’s Answer and do not find any response to Appellants’ argument in this regard. Reply Br. 1; Ans. *passim*.

“[T]he precise language of 35 U.S.C. § 102 that ‘(a) person shall be entitled to a patent unless,’ concerning novelty and unobviousness, clearly places a burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under sections 102 and 103.” *In re Warner* 379 F.2d 1011, 1016 (CCPA 1967). The Patent Trial and Appeal Board is primarily a tribunal of review. *See Ex Parte Frye*, 94

² Claims 1 and 14 each recite, “each fiducial pair corresponding to a physical point in 3D space in the region of interest.”

USPQ2d 1072, 1075–77 (BPAI 2010)(precedential). For that review to be meaningful it must be based on some concrete evidence in the record to support the Examiner’s factual findings and legal conclusions. *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001). As the Examiner has not provided “specific fact findings for each contested limitation and satisfactory explanations for such findings” (*Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997)), we do not sustain the rejections of claims 1 and 14 on the basis set forth by the Examiner. The rejections of dependent claims 2–10 and 15–21 do not account for this deficiency and must also be reversed.

With regard to independent claim 11, the Examiner initially appears to rely on Doddrell for:

- i. establishing an interpolation function configured to receive as input said real-time first coordinate and to output a corresponding second coordinate in said second coordinate system, said establishing step comprising [col. 10,11. 15–26 and col. 12, 11. 55–67];
...
 - (2) applying an interpolation algorithm to said plurality of fiducial pairs to yield said interpolation function [col. 10,11. 15–27 and col. 36,11. 56–65]; and
- ii. applying said interpolation function to said real-time first coordinate [col. 10, 11. 15–27 and col. 36, 11.56–65].

Non-Final Act. 9–10.

Appellants correctly argue, with regard to Doddrell:

there are no “fiducial pairs” that are collected, as claimed—instead, the data points in the second coordinate frame are entirely solved for, rather than collected, based on the interpolation function. Furthermore, because the coefficients of the interpolation function are known separately from the collection of data points in the second coordinate system, no “interpolation algorithm,” as claimed, is applied to yield the interpolation function.

App. Br. 10. This argument also goes without any response from the Examiner. *See* Reply Br. 1; Ans. *passim*.

Although the Examiner appears to initially rely on Doddrell regarding the limitations discussed above, the Examiner also states:

Doddrell does not explicitly disclose details regarding inputting fiducial pairs to an interpolation algorithm. Klingenberg-Regn discloses fiducial pairs that are input (scanned coordinate data) to an interpolation algorithm [paragraphs [0005] and [0015]].

Non-Final Act. 10.

Appellants argue with regard to Klingenberg-Regn, the “interpolation, though, presumes the existence of a function; the reference includes no teaching of first applying an interpolation algorithm to yield that interpolation function.” App. Br. 10 (citing Klingenberg-Regn para. 52). We again do not find any response to this argument in the Examiner’s Answer. Reply Br. 1; Ans. *passim*.

Doddrell *uses* an interpolation function in a correction method involving different coordinate systems. Non-Final Act. 9–10 (citing Doddrell col. 9, ll. 19–33; col. 10, ll. 15–27; col. 12, ll. 55–67, col. 36, ll. 32–36, 56–65). Klingenberg-Regn uses fiducial markers as reference points for “relating, aligning, or registering different images, representations and projections, which are obtained from different sources and/or at different times.” Non-Final Act. 10 (citing Klingenberg-Regn paras. 5, 15). However, it is not clear based on the Non-Final Office Action, the Answer, and a review of Doddrell and Klingenberg-Regn what specific act or acts the Examiner considers “applying an interpolation algorithm to said plurality of fiducial pairs to yield said interpolation function.” As the Examiner has again failed to provide “specific fact findings for each contested limitation and satisfactory explanations for such findings” (*see Gechter, supra*), we are

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constrained to reverse the Examiner's rejection of claim 11, as well as the rejection of dependent claims 12 and 13, which does not account for the deficiency discussed above.

DECISION

The Examiner's rejections are reversed.

REVERSED